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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/029,520	12/21/2001	David J. Hemker	LAM2P317	5915

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EXAMINER

MARKOFF, ALEXANDER

ART UNIT	PAPER NUMBER
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1746

DATE MAILED: 09/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/029,520

Applicant(s)

HEMKER ET AL.

Examiner

Alexander Markoff

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 July 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 and 21-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19, and 21-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 23 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claim is indefinite because it is not clear what is referenced as "target cleaning". How the term "target" limits the scope of the claim?

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

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consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 1-19, and 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiatt et al (US Patent No 5,963,315) in view of Yin et al (US Patent No 5,865,901) and Boszormenyi et al (US Patent No 6,394,105).

Hiatt et al teaches a method and apparatus for controlling the contamination of the backside of the wafer and for cleaning the wafer if the contamination is determined.

Hiatt et al teach controlling contamination in the areas recited by the instant claims.

Hiatt et al is concerned about particles of the claimed size.

The disclosed cleaning includes sonic activated cleaning, sprays, etc.

The apparatus is integrated with an exposure device.

The detecting means includes a laser.

The apparatus includes a controller, which store the information in the memory and controls the process.

Thus Hiatt et al concern about the same problem as the instant invention and teach a method and apparatus as claimed except for optimization of the cleaning by preferential localized cleaning of the specific areas.

However, optimization of cleaning depending from the specific place of contaminants was known in the art, as evidenced by Yin et al and Boszormenyi et al.

It would have been obvious to an ordinary artisan at the time the invention was made to optimize cleaning in Hiatt et al by directing the cleaning to the specific contaminated areas, specific contaminants and by adjusting the cleaning depending from the contamination according to the teachings of Yin et al and Boszormenyi et al with reasonable expectation of adequate results in order to enhance cleaning results and reduce the operation cost and to avoid damage of non-contaminated areas.

As to claims requiring the use of the laser.

Boszormenyi et al teach the use of the laser for both detecting the contamination and it's removal and further teach that this would result in saving in tool cost.

It would have been obvious to an ordinary artisan at the time the invention was made to provide in the modified method and apparatus of Hiatt et al a laser which would perform the detecting function recited by Hiatt et al with the cleaning functions in order to reduce the tool cost according to the teaching of Boszormenyi et al.

Response to Arguments

5. Applicant's arguments filed 7/14/05 have been fully considered but they are not persuasive. The applicants amended the claims to add the limitation of "the cleaning omitting portions of the backside of the wafer not having physical contact with the

chuck. During the semiconductor fabrication process” and argue that the applied rejection is not proper.

The arguments are not persuasive:

As to apparatus claims – the newly introduced limitation is mere recitation of the intended use of the apparatus. Since the modified apparatus of the prior art would be fully capable of defining the sites of the particles and cleaned these sites it would be fully capable of defining cleaning areas containing particles sites, including the sites recited by the claims, and cleaning them.

As to the method claims – the newly introduced limitation requires cleaning of the specific sites to omit portions of the wafer. The claims are still written using language “comprising” and do not exclude any other steps. It is noted that the precise cleaning of the specific contaminated sites disclosed by Yin et al and Boszormenyi et al clean only a specific site at a time and do not clean entire surface or all contaminated areas at the same time. It means that the cleaning of the specific contaminant as disclosed by Yin et al and Boszormenyi et al omit cleaning of other parts of the surface at the time of cleaning. The claims, which require the cleaning of the specific sites to omit cleaning of other portions of the surface do not exclude cleaning of other parts of the surface in a separate step.

On the other hand, it is noted that if the wafer is contaminated as described by Hiatt et al (at least Figs. 1 and 2 and the related description) the modified method of Hiatt et al would omit cleaning of the parts of the surface not being in contact with the chuck because it would be no contamination on that parts and because the cleaning

according to Yin et al and Boszormenyi et al is directed only to contaminants. It is noted that Yin et al specifically teach avoiding cleaning of non-contaminated areas to reduce the operation cost.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

As to argument that Yin et al teach only cleaning of front surface of the wafer. Nothing in Yin et al supports the applicants' statement. Yin et al teach cleaning of surfaces in need of cleaning. The claims are limited for cleaning directed from below of the wafer, not exclude transferring or turning the wafer, do not exclude any steps for manipulating or handling the wafer. Moreover, the rejection is made over a combination of documents not Yin et al alone. The teaching of Yin et al is used to show that an ordinary skill in the art having the teaching of Yin et al would know that cleaning of contaminated cites is beneficial compare with cleaning the entire surface. Hiatt et al teach a method and apparatus, which clean the backside of the wafer.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

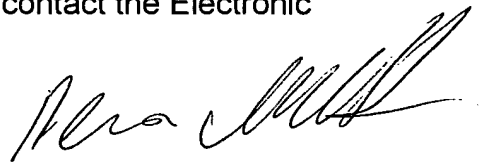
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander Markoff whose telephone number is 571-272-1304. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on 571-272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Alexander Markoff
Primary Examiner
Art Unit 1746

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ALEXANDER MARKOFF
PRIMARY EXAMINER